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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/589,580

02/15/2007

Yutaka Mitani

295054US0PCT

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06/26/2008

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ALEXANDRIA, VA 22314

EXAMINER

MACAULEY, SHERIDAN R

ART UNIT

PAPER NUMBER

1651

NOTIFICATION DATE

DELIVERY MODE

06/26/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/589,580	Applicant(s) MITANI ET AL.	
	Examiner SHERIDAN R. MACAULEY	Art Unit 1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) 4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :11/16/2006, 12/12/2006, 1/23/2008.

DETAILED ACTION

Claims 1-4 are pending.

Election/Restrictions

1. Applicant's election with traverse of claims 1-3 in the reply filed on May 15, 2008 is acknowledged. The traversal is on the ground(s) that an examination of the nonelected subject matter would not place a serious search burden on the examiner. This is not found persuasive because the groups set forth in the office action mailed on April 15, 2008 were not found to relate to a general inventive concept for the reasons discussed in the action. Furthermore, the prior art applicable to the elected subject matter, which recites a process of producing a biogas wherein a specific amount of substrate is utilized, would likely not be applicable to the nonelected subject matter, which recites a process of producing a biogas wherein hops are added to inactivate a contaminant. Therefore, the examination of all claims would place an undue search burden on the examiner.
2. The requirement is still deemed proper and is therefore made FINAL.
3. Claim 4 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.
4. Claims 1-3 are examined on the merits in this office action.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. The term "maximum tolerable concentration" in claim 1 is a relative term which renders the claim and its dependents indefinite. The term is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. A "maximum tolerable concentration" could be interpreted as the concentration of a substrate that causes a decrease in growth by the organisms, a decrease in growth rate of the organisms, some negative effect on the fermentation equipment (e.g., corrosion of a stainless steel bioreactor), or some other effect. Therefore, the metes and bounds of the claim would be unclear to one of ordinary skill in the art.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Taguchi et al. (US 5,350,685). Claim 1 recites a method for producing a biogas comprising: a

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first step of determining, according to a correlation between a concentration of a predetermined substrate in a liquid to be processed containing an organic matter and a rate of consumption of the substrate by a hydrogen-fermenting microorganism, a maximum tolerable concentration of the substrate consumable by the hydrogen-fermenting microorganism; and a second step of generating a biogas comprised of hydrogen by causing the hydrogen-fermenting microorganism to hydrogen-ferment the liquid to be processed while keeping the substrate in the liquid to be processed at a concentration not higher than a maximum tolerable concentration. Claim 2 recites that the substrate of claim 1 is a glucide.

10. Taguchi teaches a method for producing a biogas comprised of hydrogen by causing hydrogen-fermenting organisms to ferment a liquid while keeping the substrate in the liquid to be processed at a concentration not higher than a maximum tolerable concentration (abstract, col. 7, lines 36-69). Taguchi teaches that the substrate may be a heterogeneous carbohydrate source (i.e., a glucide) and teaches the determination of a correlation between a concentration of the substrate and the rate of consumption of the substrate (measured as the production of hydrogen gas (col. 7, lines 36-69, col. 8, lines 43-51).

11. Therefore, Taguchi anticipates all of the limitations of the cited claims.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taguchi et al. (US 5,350,685) in view of Kishimoto (JP 61-008200, see English abstract; documents cited in IDS). Claim 1 recites a method for producing a biogas comprising: a first step of determining, according to a correlation between a concentration of a predetermined substrate in a liquid to be processed containing an organic matter and a rate of consumption of the substrate by a hydrogen-fermenting microorganism, a

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maximum tolerable concentration of the substrate consumable by the hydrogen-fermenting microorganism; and a second step of generating a biogas comprised of hydrogen by causing the hydrogen-fermenting microorganism to hydrogen-ferment the liquid to be processed while keeping the substrate in the liquid to be processed at a concentration not higher than a maximum tolerable concentration. Claim 2 recites that the substrate of claim 1 is a glucide. Claim 3 recites the method of claim 1 further comprising a third step of generating a fermentation gas comprised of methane by causing a methane-fermenting microorganism to methane-ferment the fermented liquid after the hydrogen fermentation in the second step.

16. Taguchi teaches a method for producing a biogas comprised of hydrogen by causing hydrogen-fermenting organisms to ferment a liquid while keeping the substrate in the liquid to be processed at a concentration not higher than a maximum tolerable concentration (abstract, col. 7, lines 36-69). Taguchi teaches that the substrate may be a heterogeneous carbohydrate source (i.e., a glucide) and teaches the determination of a correlation between a concentration of the substrate and the rate of consumption of the substrate (measured as the production of hydrogen gas (col. 7, lines 36-69, col. 8, lines 43-51)). The reference does not specifically teach the use of the fermentation medium for the production of methane after the hydrogen production step.

17. Kishimoto teaches a method of producing a biogas using a process wherein decomposed organic matter and hydrogen produced in previous steps are fed into a system wherein methane gas is produced by methane-producing organisms.

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18. At the time of the invention, a method for the production of biogas by fermentation comprising nearly all of the claimed elements was known, as taught by Taguchi. It was further known that fermented organic matter could be used for the production of methane, as taught by Kishimoto. One of ordinary skill in the art would have been motivated to combine these teachings because Taguchi teaches the use of hydrogen-fermenting organisms for the decomposition of organic matter and Kishimoto teaches the use of decomposed organic matter as a substrate for methane-producing organisms. One would thus have recognized that the method of Taguchi could be combined with the method of Kishimoto for the enhanced yield of biogas described by Kishimoto. One would have had a reasonable expectation of success because the production of the claimed biogases were known in the art at the time of the invention, as was the combination of multiple fermentations, as taught by each of the references. It would therefore have been obvious for one of ordinary skill in the art to combine the teachings discussed above to arrive at the claimed invention.

19. Thus, the claimed invention as a whole was *prima facie* obvious over the combined teachings of the prior art.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHERIDAN R. MACAULEY whose telephone number is

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(571)270-3056. The examiner can normally be reached on Mon-Thurs, 7:30AM-5:00PM EST, alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon B Lankford Jr/
Primary Examiner, Art Unit 1651

SRM